

## A Survey of Physicians' Breast Cancer Early Detection Practices

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Early detection of breast cancer through the use of mammography reduces long-term mortality from this disease, yet relatively little is known about its acceptance by the medical community. As part of a state health department cancer control program planning effort, we contacted 1,004 primary-care physicians in Pennsylvania to ascertain current breast cancer early detection practices. While 92% of the 557 eligible respondents reported conducting breast physical examinations at least annually in asymptomatic women age 50 or older, annual mammograms for this age group were ordered by only 42% of physicians. Obstetrician-gynecologists, as well as female and younger physicians, were more likely to obtain nondiagnostic mammograms regularly. Factors reported by physicians as affecting their practice of obtaining mammograms varied by patient age and, among patients 50 years and older, included the claim that their mammography practices represented optimal care (57% of the physicians), how often the patient visited their office (23%), patient refusal (16%), and cost of the examination (16%). Fear of radiation and expense were cited as the primary reasons for patient refusal. Public and physician education, as well as third-party payment changes, was viewed by the physicians as the most effective means to increase the level of breast cancer early detection in their geographic areas. This survey shows that the use of nondiagnostic mammography is still less than optimal, and identifies impediments to screening that need to be addressed in cancer control planning efforts. © 1988 Academic Press, Inc.

### INTRODUCTION

Breast cancer remains a leading cause of cancer mortality among women in the United States. Each year approximately three-quarters of this country's 40,000 deaths from breast cancer occur in women over the age of 50 (17). At the time of diagnosis, only half of all cases involve localized disease, which is associated with average 10-year survival (i.e., 74%) almost twice as great as that for regional disease (39%), and over 10 times that for metastatic illness (<5%) (8). Therefore, in the absence of any current primary prevention methods for breast cancer (11), early detection of this disease is essential for meaningful mortality reductions to occur.

Early reports indicated a significant (30%) decrease in breast cancer mortality in women age 50 and over who participated in the randomized trial of the Health Insurance Plan (HIP) of Greater New York and received an annual breast physical examination and mammography (13, 14). The most recent 16-year follow-up of the 62,000 participants has confirmed the long-term benefit of the combined modality

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screening program (15); this has been corroborated by data from other studies (5, 16). These research efforts have led to widespread recommendations for the incorporation into routine medical practice of annual breast cancer screening examinations (i.e., physical and mammography) for all women age 50 and over (1, 3, 9). At present, however, the degree to which effective early breast cancer detection is achieved is not widely known, although a few studies suggest that adherence by the medical community to the suggested guidelines is far from complete (2, 7, 10).

In order to assess current breast cancer early detection practices, we surveyed a sample of physicians in Pennsylvania as part of a state health department cancer control program planning effort. We obtained both quantitative estimates of screening practices and qualitative information regarding reasons for current practices, impediments to more effective screening, possible differences between urban and rural geographic areas or between medical specialties, and opinions concerning potential future initiatives. Our findings are the subject of this article.

### METHODS

Membership files of the Pennsylvania Medical Society (PMS) were used to identify general or family practitioners, internists, and obstetrician-gynecologists; that is, primary care physicians most likely to conduct the majority of breast cancer early detection. In order to provide some assessment of potential differences in practices between more urban and rural locations in the state, two distinct geographic areas were chosen for study. These were Allegheny County (including Pittsburgh), representing an urban and suburban population, and a separate group of 19 counties in more rural south-central Pennsylvania (see Fig. 1). The rate of PMS membership is approximately 70% among physicians state-

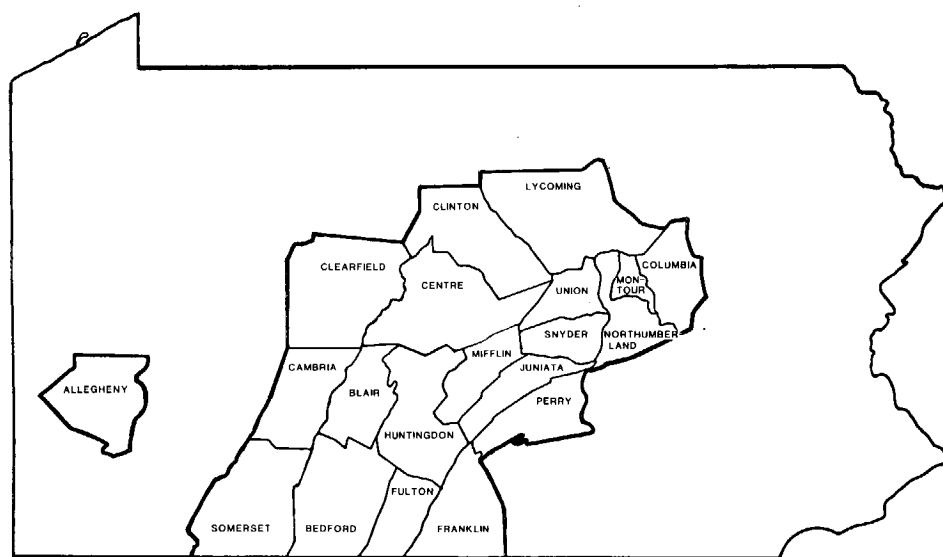
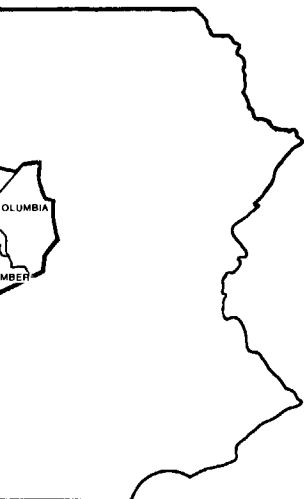


FIG. 1. Map of areas of Pennsylvania included in the survey.

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wide, while that for the 20 counties included in this survey is 66%. Based on information available through PMS, non-PMS physicians in these counties were more likely than the PMS survey population to be in residency training (35 and 9%, respectively), younger (e.g., <45 years old: 78 and 52%, respectively), female (23 and 10%), specializing in internal medicine (55 and 37%), and less likely to be obstetrician-gynecologists (10 and 20%).

During February and March 1986, a questionnaire was mailed to 1,004 PMS physicians of the four selected specialty groups, which included a random 50% sample of those practicing in Allegheny County ( $n = 421$ ), and all members from the 19 south-central counties ( $n = 583$ ). The structured questionnaire was similar to one used in a previous survey (7). It included background information questions and asked physicians about their usual methods of practice regarding breast examination and mammography for specific patient age groups, 20-39, 40-49, and  $\geq 50$  years old. Reasons for medical practices and recommendations for increasing breast cancer screening locally were also queried. A total of 633 physicians returned the form (63%), and the response rate was similar across counties. Of these, 76 were excluded because they were retired ( $n = 71$ ), or were ill or deceased ( $n = 5$ ). This study is therefore based on the 557 practicing physicians who were eligible and responded.

The  $\chi^2$  test statistic (4) was used for the comparison of proportions in these data.

## RESULTS

### *Survey Population*

Most of the 557 respondents were male (90%), in solo (52%) or group (38%) practice (10% were in health maintenance organizations, academic, or other types of practice), of which the large majority was primary care. The year of medical school graduation ranged from 1926 to 1985 (median, 1969). Medical specialties had the following representation: 17% general practice; 35% family practice; 25% internal medicine; and 23% obstetrics and gynecology. The age, sex, and geographic distributions of the respondents (53% less than 45 years old and 16% over 64 years old, 90% male, 40% in Allegheny county) were nearly identical to those of the survey population (51, 20, 90, and 44%, respectively). In contrast, internists made up a greater (46%), and family practitioners a smaller (20%), proportion of the nonrespondents than of the respondents (there were no such differences for general practitioners or obstetrician-gynecologists).

### *Breast Exam*

Physician practices with respect to frequency of breast physical examination by patient age are presented in Fig. 2. Most physicians performed breast examinations at least annually for each age group: of these, 92% performed exams for women  $\geq 50$ . There were no statistically significant differences in the frequency of examination between patient age groups. The median number of exams conducted for every 100 asymptomatic women seen in all practices was 75. Frequency of patient visits (i.e., how often the woman is seen by the physician) and purpose of

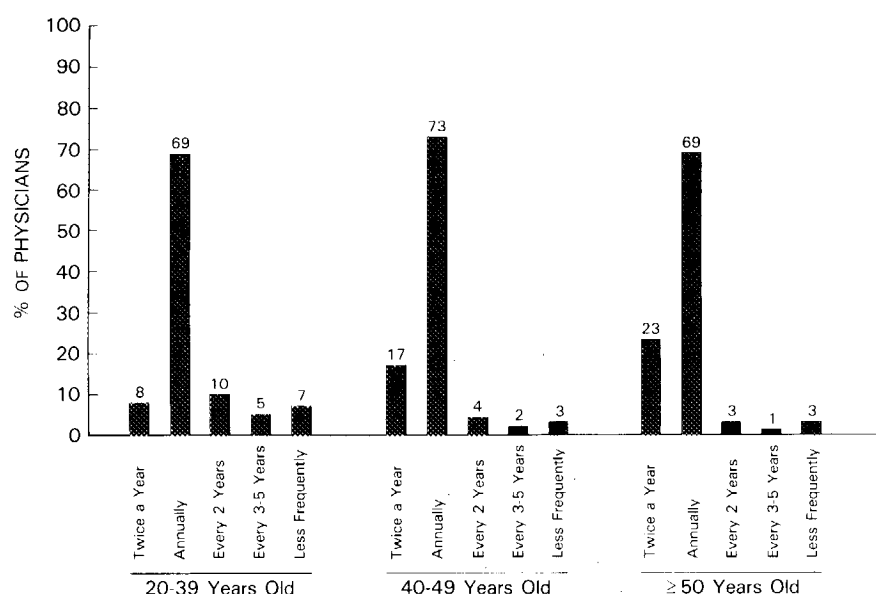


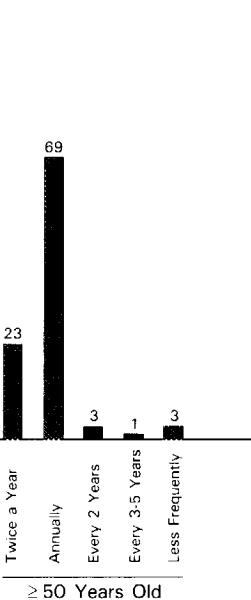
FIG. 2. Frequency of breast physical examination by physicians according to patient age group.

the visits (i.e., routine exam, for symptoms), as well as the claim of optimal care (i.e., they believe that their frequency of breast examination represents standard medical practice), were the primary reasons given for the above breast examination frequencies. There was no significant urban-rural difference in breast physical examination practices.

### Mammography

In contrast to the similarity of physical exam practices for different age groups, the reported use of nondiagnostic mammography varied greatly by patient age (Fig. 3). Few physicians ordered mammograms regularly for asymptomatic women 20-39 years old, but frequency of prescribed mammography increased with patient age. Women 40-49 years old usually had mammography ordered once every 3 to 5 years or biennially. The most common frequency of nondiagnostic mammography for women 50 years or older reported by the physicians was annual, followed by biennial exams. The proportion of physicians obtaining annual mammograms for women in this age group was much greater than that with respect to 40- to 49-year-old women ( $\chi^2$  137.41,  $P \leq 0.0001$ ). Only 37 physicians (7%) did not report using mammography for the early detection of breast cancer even in the oldest age group. However, most physicians reported ordering mammograms more frequently for women having a positive family history of breast cancer: 78, 92, and 86% of the respondents did so for the youngest (i.e., 20-39 years) to oldest (i.e.,  $\geq 50$  years) patient age groups.

We observed the following differences in mammography practices among physician subgroups. Female physicians were somewhat more likely to screen women



according to patient age group.

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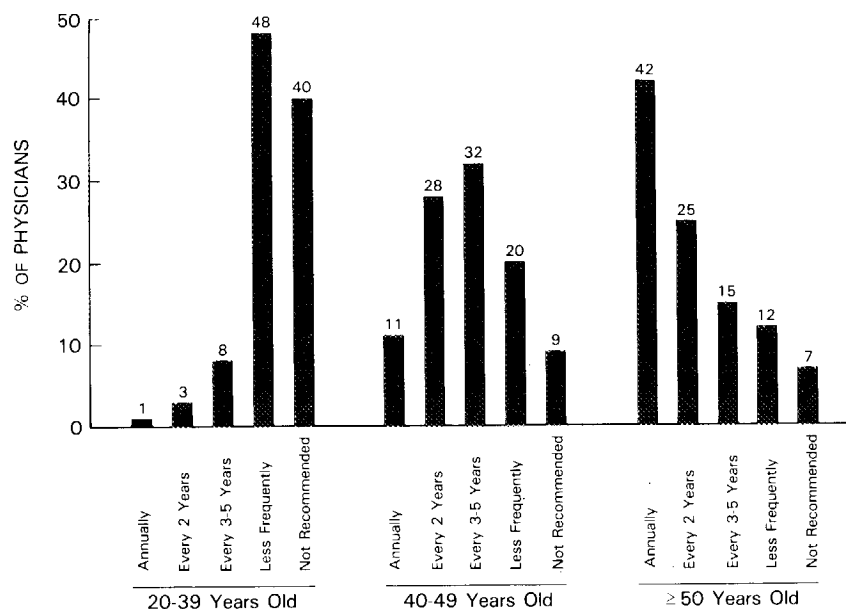


FIG. 3. Frequency of physician mammogram use for asymptomatic women according to patient age group.

≥50 years annually than were male physicians (53 and 41%, respectively;  $\chi^2$  2.70,  $P = 0.10$ ). Among specialties, 52% of the obstetrician-gynecologists reported the regular (i.e., annual) use of mammography for breast cancer early detection in women ≥50 years, followed by internists (44%), family practitioners (42%), and general practitioners (27%). Therefore, obstetrician-gynecologists used mammography for nondiagnostic purposes notably more than did family practitioners ( $\chi^2$  3.20,  $P = 0.07$ ) and general practitioners ( $\chi^2$  12.16,  $P = 0.0005$ ), and general practitioners also ordered far fewer such examinations than did internists ( $\chi^2$  6.30,  $P = 0.01$ ) and family practitioners ( $\chi^2$  5.07,  $P = 0.02$ ). Based on three periods of medical school graduation (i.e., prior to 1963, 1963-1978, and after 1978), the proportion of physicians using annual mammography increased from 36% in the oldest group to 45 and 46% in the younger groups ( $\chi^2$  3.29,  $P = 0.07$ , and 4.05,  $P = 0.04$ , respectively). The screening mammography use was similar in urban Allegheny County and the rural areas surveyed (45 and 41%, respectively;  $\chi^2$  0.78,  $P = 0.37$ ).

The reasons for frequency of ordering mammograms according to patient age appear in Table 1. While low disease incidence was the primary reason cited for the infrequent recommendation in the youngest patient age group, the claim of optimal care, as well as patient office visit frequency, patient refusal, and expense, were factors contributing to the degree to which physicians used mammography for screening in all patient age groups.

Three hundred seventy-six (67%) of the physicians stated that they obtain baseline mammograms. The most common ages at which patients received such ex-

TABLE 1  
PROPORTION OF PHYSICIANS IDENTIFYING SPECIFIC REASONS FOR THEIR LEVEL OF MAMMOGRAM  
USE ACCORDING TO PATIENT AGE GROUP

Physician reason <sup>a</sup>	Patient age group (years)		
	20-39	40-49	50+
Considered their practice optimal care	29%	52%	57%
Frequency of patient visits	15	23	23
Patient refusal of mammogram	16	18	16
High cost of the test	19	16	16
Low incidence in age group	46	5	2
Test increases risk of cancer	9	4	3
Test is not reliable	4	3	3
Inconvenient location of unit	4	3	3

<sup>a</sup> Physicians were permitted to select one or more reasons.

aminations were 40 years (38% of physicians), followed by 35 years (21%), and 45 and 50 years (14% each); the range was 20-60 years. When the physicians were asked about the reasons why their patients would refuse to have a mammogram if it was recommended, 34% stated this rarely occurred in their practice; however, fear of radiation (59%), expense (57%), and location of the test facility (9%) were cited as the primary reasons for patient refusals when they did occur.

#### *Breast Self-Examination*

We also asked about practices concerning breast self-examination (BSE). Among respondents 94% (534) reported that they ascertain patient BSE practices and provide instruction through their practices to women who lack knowledge of BSE. Demonstration on the patient, as well as printed materials were the most commonly used methods: 90 and 62% of physicians who do teach BSE, respectively. Used less often were models (11%) or video tapes (5%). Among the 22 physicians who do not provide BSE instruction, six reported that it would take too much time, only three reported that patients are reluctant to learn, and 13 offered other (or no) reasons.

#### *Future Efforts*

Three out of four physicians believed breast cancer screening efforts should be increased in their respective geographic areas (Fig. 4). Public education, enhanced physician training and education, and third-party payment changes were viewed as the most effective means toward that goal.

### DISCUSSION

Guidelines for the combined use of breast physical examination and mammography have been available for several years (1, 3, 9), and include recommendation of annual physical and mammographic examination for women  $\geq 50$  years of age and older. Despite these guidelines, however, a recent national survey revealed that among women 50-70 years old, 45% claimed to receive an annual breast

# THEIR LEVEL OF MAMMOGRAM GROUP

Patient age group (years)	40-49	50+
	52%	57%
	23	23
	18	16
	16	16
	5	2
	4	3
	3	3
	3	3

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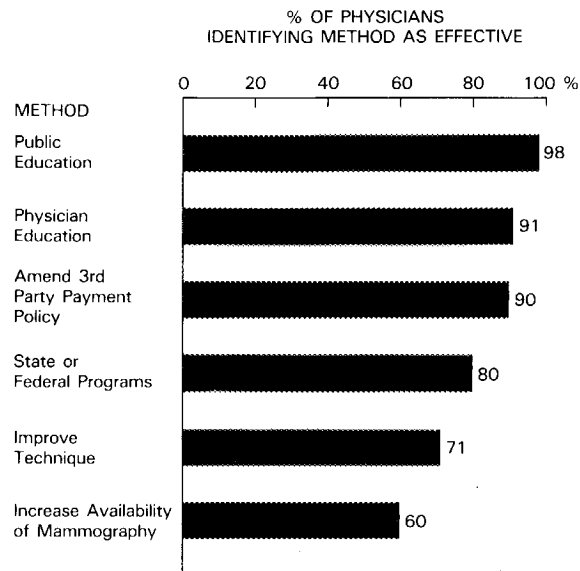


FIG. 4. Proportion of physicians supporting increased breast cancer screening in their geographic areas and suggested effective methods.

physical examination, and only 15% receive an annual mammogram (6). Moreover, a case-record study by the American College of Surgeons of over 12,000 breast cancers showed that only 4% of breast malignancies were discovered by mammography, while 23% were discovered by a physician, and the remaining 73% by the patient herself (12). This apparent deficit of optimal early breast cancer detection within current medical practices has also been reflected in three recent physician surveys (2, 7, 10).

In this study, over 90% of the physicians reported having performed annual breast physical examinations on, and having taught BSE to, their female patients. These estimates are very similar to those demonstrated in the American Cancer Society (ACS) survey (2). In contrast, approximately 40% of the physicians in our study claimed to obtain annual or biennial mammograms in asymptomatic women 40-49 years old, following the ACS (1) and American College of Radiology (ACR) (3) guidelines, or annual exams for women age 50 and over, a practice compatible with ACS (1), ACR (3), and the National Cancer Institute (9) recommendations. This level of mammogram use is greater than that reported for either New York state family practitioners (7), a California group practice (10), or the ACS national physician survey sample (2). In the former study, only 8% of the small sample ( $n = 270$ ) surveyed in 1982 recommended an annual mammogram for women over 50 years old (13% recommended annual or biennial exams in 40-49 years old), even though 88% of the same sample believed that mammography was effective in detecting breast cancer at an early stage. In the same year, a record review of a West-coast group practice demonstrated similar rates of mammogram use, with no apparent differences between "primary care" and "specialist care" practices

(9). A slightly greater proportion (11%) of U.S. primary care physicians interviewed in 1984 by the ACS followed all of the ACS guidelines concerning nondiagnostic mammography, including a baseline examination, at least biennial use in 40- to 49-year-old women, and annual use for women over 50 (2). The proportion of physicians obtaining annual mammograms for women  $\geq 50$  years, with or without baseline examinations or screening use in younger women, was not reported in this study, however. Because these earlier physician surveys were conducted when official recommendations were first being issued for the nondiagnostic use of mammography, it is possible that greater mammogram use would be demonstrated if they were repeated today. Our findings may, therefore, be indicative of a trend in the medical community (possibly intrinsic to Pennsylvania) toward increased early breast cancer detection.

Alternatively, some aspects of study design could have biased these findings. Our sampling frame (i.e., using only PMS physicians) excluded one-third of all physicians in the survey areas. Although we cannot quantitate their use of mammography, we know that non-PMS physicians included proportionally more younger and female physicians; that is, groups somewhat more likely to use mammography for screening. Based on this alone, the level of mammography in our sample might be an underestimation of true utilization. In addition, while our response rate is similar to the 60% obtained in the mail survey of physicians conducted in New York state (6), it is less than optimal, and we cannot rule out response bias (i.e., whether physicians who regularly use mammography for screening were more likely to have responded to the survey than those who do not). Survey nonrespondents were, however, of similar age, sex, and geographic distribution to the respondents, and they were also more likely to be internists and less likely to be family practitioners.

Overreporting of positive behavior or practices is common in self-report surveys and may have also affected our results. Similarly, even though the questionnaire was designed to stress the importance of actual practices as opposed to knowledge concerning guidelines, the distinction may not have also been clear to the physicians, resulting in some reporting of practices that reflected ideals rather than true utilization. Sponsorship bias could also have prompted overestimates of screening mammogram use, with physicians wanting to portray an adequate level of breast cancer early detection to the state health department. The fact that the survey cover letter openly acknowledged the intended use of its findings for future health department program planning (that might affect the medical community) strengthens this possibility. Other differences in questionnaire or interview design could also account for some of the discrepancies between the physician surveys. Finally, we cannot determine whether the level of nondiagnostic mammogram use reported to us is an adequate reflection of the medical care received by all women living in these areas, or is an overestimate based on a well-served patient subgroup. An investigation of all mammographic units in the areas of our physician sample has been conducted in order to assess patient utilization and potential capacity, and should offer an additional assessment of nondiagnostic mammography in Pennsylvania.

Even with the relatively high estimate of screening frequency found in this



primary care physicians interviewed concerning nondiagnostic use in women over 50 (2). The proportion of women  $\geq 50$  years, with or without mammography, was not reported in the surveys were conducted for the nondiagnostic use of mammography would be demonstrated, therefore, be indicative of the trend in Pennsylvania) toward

may have biased these findings. The study excluded one-third of all physicians to estimate their use of mammography. It included proportionally more physicians who were somewhat more likely to use mammography at the level of mammography in the study. In addition, while our study was a mail survey of physicians nationwide, and we cannot rule out that physicians who use mammography for early detection in our survey than those who do not, by age, sex, and geographic location are likely to be internists and

common in self-report surveys, even though the questionnaire practices as opposed to physician interviews may not have also been clear to patients that reflected ideals rather than actual practices prompted overestimates of physician use to portray an adequate level of early detection. The fact that the study used its findings for future research (the medical community) and the questionnaire or interview design may differ between the physician surveys. The use of nondiagnostic mammogram use in the study may not be received by all women in a well-served patient sub-sample. The areas of our physician survey on utilization and potential barriers to nondiagnostic mammog-

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survey, the degree of underutilization remains substantial. Limited frequency of patient visits, physician misinformation concerning guidelines, patient refusal, and expense of the examination are the primary impediments to optimal mammogram use we identified. For example, only 61% of the 317 respondents in our study who claimed that their use of mammography in women at least 50 years old was "optimal care" actually obtained screening exams annually for this age group. Physician misinformation and expense were also very important factors in two of the prior physician surveys (2, 6). In contrast to the same studies, however, relatively few physicians in our survey (3%) stated that the potential risk to their patients associated with radiation exposure diminished their use of the test. These findings suggest that having provided physicians with information concerning the low level of radiation involved in mammography may have contributed to increased utilization over the past 5 years. The data also suggest that continued efforts at physician education and modification of existing cost schedules or third-party reimbursement may lead to greater incorporation into the medical care system of early detection practices and a decrease in breast cancer mortality. It is interesting, however, that the frequency and purpose of patient visits were also primary reasons given by physicians for the frequency of breast physical examination, even though biannual or annual exams among women over 40 were reported by 90% or more of the sample. This implies that the current level of breast cancer early detection is a function of the health-care delivery system, patient behavior, and adherence by the medical community to optimal care guidelines.

Strategies for overcoming many of the above impediments to breast cancer mortality reduction are being undertaken in Pennsylvania at this time. These efforts include education of high-risk women, reduced-fee community or hospital mammography programs, physician education, and amendment of third-party payment schedules. Wider and more active efforts on the part of the medical community to detect early breast cancer are also clearly indicated.

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